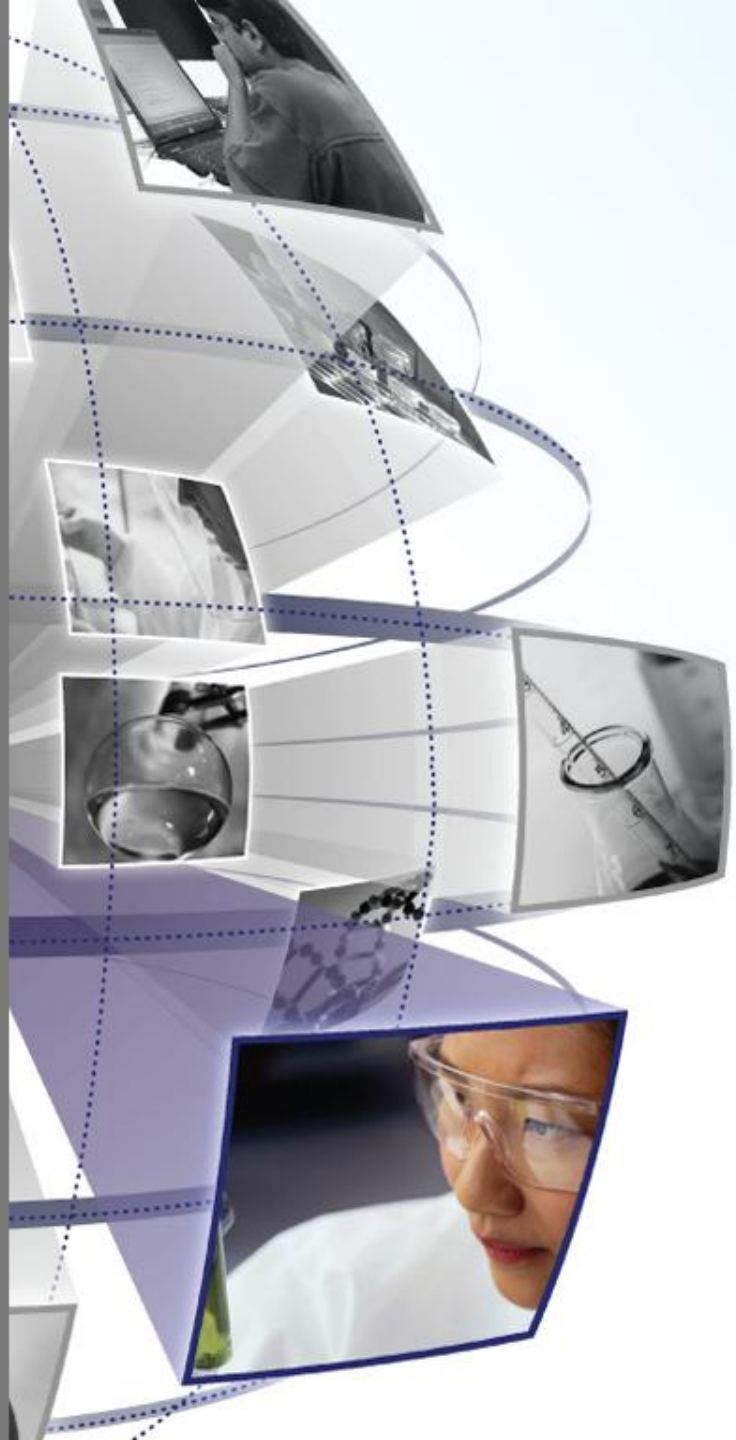
National Cancer Institute



caBIG™
cancer Biomedical Informatics Grid™

nano-TAB

specification to facilitate the data exchange among nanotechnology resources

Nanoinformatics 2010

Stacey Harper, PhD Oregon State
November 3-5, 2010

Agenda

- **nano-TAB Introduction**
- **nano-TAB Structure**
  - Investigation File
  - Specimen File
  - Material File
  - Assay File
- **Getting Started**
- **nano-TAB Future**

The Challenge

Data sharing is challenging in nanomedicine

- **Numerous physico-chemical, *in vitro*, and *in vivo* assays**
- **Measurements dependent on non-standardized protocols and diverse technology types**
- **Nanomaterial descriptions are represented in an undisciplined fashion**
- **No meaningful data sharing across the community due to lack of standardization**
- **Insufficient information in publications results in inadequate interpretation of results and failures in experimental reproducibility**

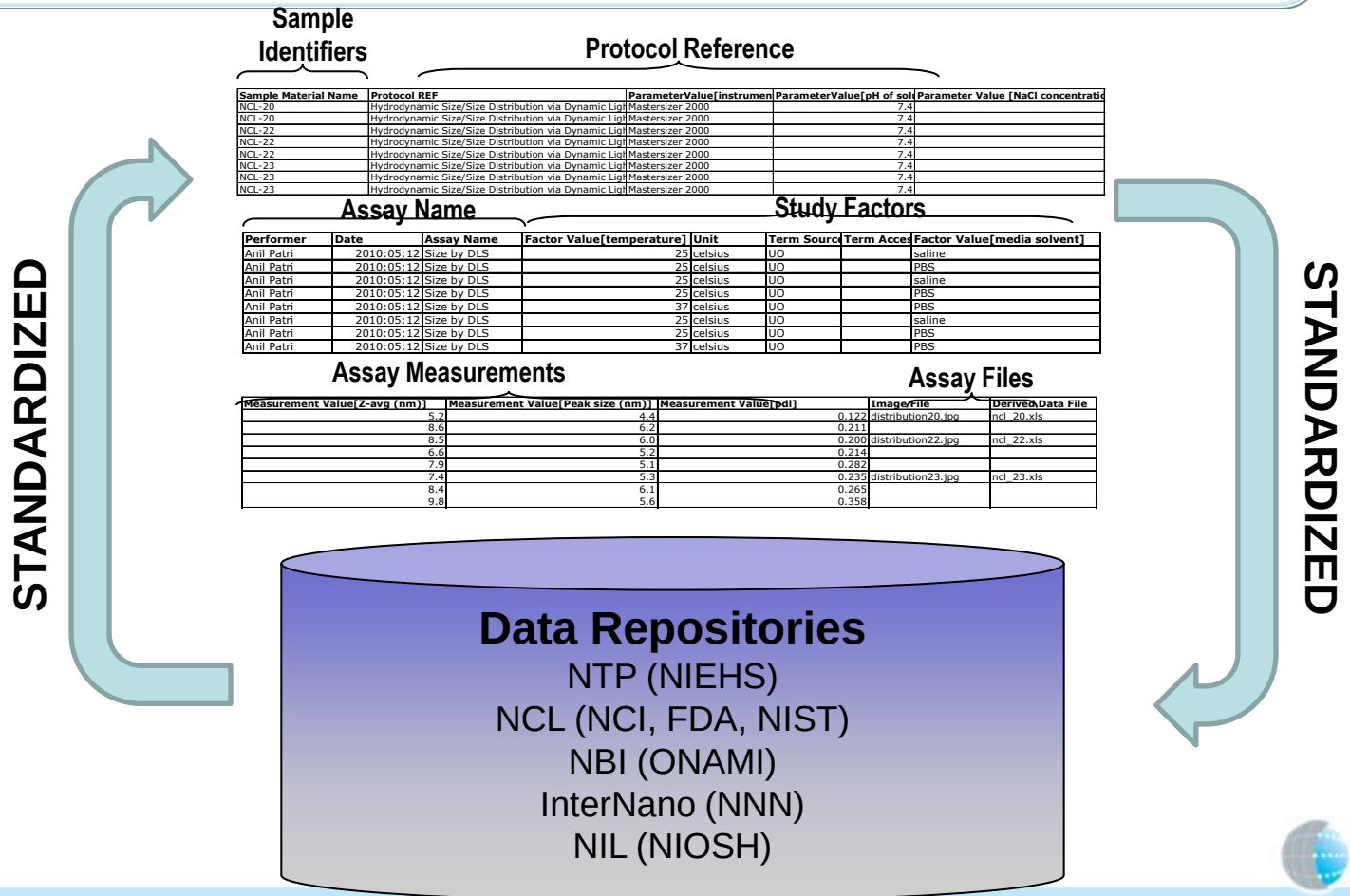
nano-TAB Specification

What is nano-TAB?

- A standard tab-delimited format for describing data related to investigations, nanomaterials, specimens, and assays in nanomedicine
- Leverages and extends the Investigation/Study/Assay (ISA-TAB), a standard tab-delimited file format developed by the European Bioinformatics Institute (EBI) for representing a variety of assays and technology types
- nano-TAB supports ontology-based curation; nanomaterials and concepts from the NanoParticle Ontology (NPO)

Goal of nanoTAB

- **To develop a specification to facilitate the import/export of data on nanomaterials and their characterizations to/from nanotechnology resources**



Sample Material Name	Protocol REF	ParameterValue[instrumen	ParameterValue[pH of sol	Parameter Value [NaCl concentratic
NCL-20	Hydrodynamic Size/Size Distribution via Dynamic Ligl	Mastersizer 2000	7.4	
NCL-20	Hydrodynamic Size/Size Distribution via Dynamic Ligl	Mastersizer 2000	7.4	
NCL-22	Hydrodynamic Size/Size Distribution via Dynamic Ligl	Mastersizer 2000	7.4	
NCL-22	Hydrodynamic Size/Size Distribution via Dynamic Ligl	Mastersizer 2000	7.4	
NCL-22	Hydrodynamic Size/Size Distribution via Dynamic Ligl	Mastersizer 2000	7.4	
NCL-23	Hydrodynamic Size/Size Distribution via Dynamic Ligl	Mastersizer 2000	7.4	
NCL-23	Hydrodynamic Size/Size Distribution via Dynamic Ligl	Mastersizer 2000	7.4	
NCL-23	Hydrodynamic Size/Size Distribution via Dynamic Ligl	Mastersizer 2000	7.4	

Performer	Date	Assay Name	Factor Value[temperature]	Unit	Term Source	Term Acces	Factor Value[media solvent]
Anil Patri	2010:05:12	Size by DLS	25	celsius	UO		saline
Anil Patri	2010:05:12	Size by DLS	25	celsius	UO		PBS
Anil Patri	2010:05:12	Size by DLS	25	celsius	UO		saline
Anil Patri	2010:05:12	Size by DLS	25	celsius	UO		PBS
Anil Patri	2010:05:12	Size by DLS	37	celsius	UO		PBS
Anil Patri	2010:05:12	Size by DLS	25	celsius	UO		saline
Anil Patri	2010:05:12	Size by DLS	25	celsius	UO		PBS
Anil Patri	2010:05:12	Size by DLS	37	celsius	UO		PBS

Measurement Value[Z-avg (nm)]	Measurement Value[Peak size (nm)]	Measurement Value[pdl]	Image File	Derived Data File
5.2	4.4	0.122	distribution20.jpg	ncl_20.xls
8.6	6.2	0.211		
8.5	6.0	0.200	distribution22.jpg	ncl_22.xls
6.6	5.2	0.214		
7.9	5.1	0.282		
7.4	5.3	0.235	distribution23.jpg	ncl_23.xls
8.4	6.1	0.265		
9.8	5.6	0.358		

How will nano-TAB be useful?

- Address the data sharing challenges in nanomedicine
- Provide a standard means for identifying nanomaterials and characterizations
- Enable the submission and exchange of nanomaterial data to/from nanotechnology data resources (e.g., NBI, caNanoLab, etc.)
- Empower organizations to adopt standards for representing data in nanotechnology publications
- Provide researchers with guidelines for representing nanomaterials and characterizations to achieve cross-material comparison

Agenda

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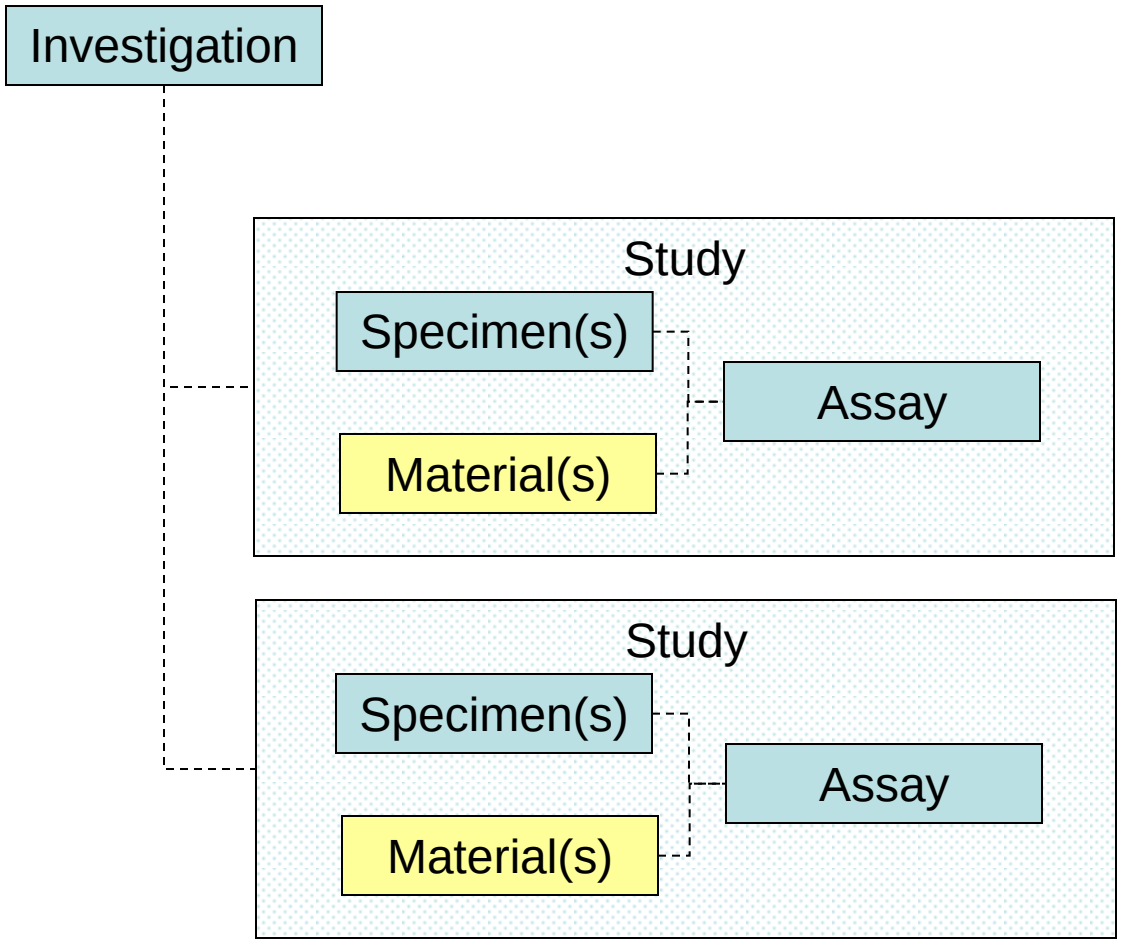
- **nano-TAB Structure**
  - Investigation File
  - Specimen File
  - Material File
  - Assay File
- **Getting Started**
- **nano-TAB Future**

Nano-TAB Structure



nano-TAB File Development

1. Describe the Investigation and Studies

2. Identify Study Samples

3. Record Assay Conditions and Measurements

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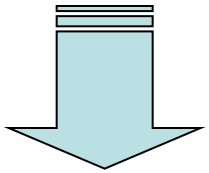
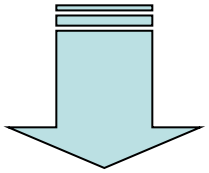
nano-TAB File Development

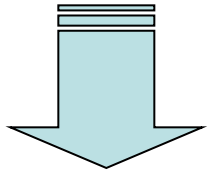
1. Describe the Investigation and Studies

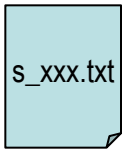


Investigation File

2. Identify Study Samples

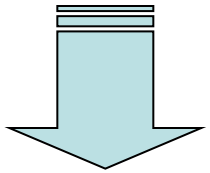


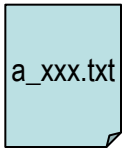




Material File(s) Specimen File(s)

3. Record Assay Conditions and Measurements





Assay File(s)

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nano-TAB File Development

1. Describe the Investigation and Study

2. Identify Study Samples

3. Record Assay Conditions and Measurements

nano-TAB File Development

1. Describe the Investigation and Study

2. Identify Study Samples

3. Record Assay Conditions and Measurements

- The Investigation File describes the primary investigation, associated studies, assays, and protocols
- Descriptive information about the study includes design descriptors, publications, factors, assays, protocols, and contacts
- The Investigation File format leverages a vertical based spreadsheet format with columns representing multiple values

Investigation File

ONTOLOGY SOURCE REFERENCE		
Term Source Name	MO	NPO
Term Source File		
Term Source Version	v1.0	v1.0
Term Source Description	MGED Ontology	Nanoparticle Ontology
INVESTIGATION		
Investigation Identifier	NCL200612A	
Investigation Title	Dendrimer-Based MRI Contrast Agents	
Investigation Description	The objective of the Dendritic Nanotechnologies, Inc. - NCL collaboration is to characterize a PAMAM dendrimer with an associated gadolinium chelate MRI contrast agent. The nanomaterials submitted for testing at the NCL were (NCL20) G4 tris (hydroxyl) terminated PAMAM dendrimer, (NCL21) G4 pyrrolidinone terminated PAMAM dendrimer, (NCL22) G4.5 CDONs terminated PAMAM dendrimer, (NCL23) G4.5 CDONs terminated PAMAM dendrimer-Magnevist/E complex, (NCL25) G4 tris (hydroxyl) terminated PAMAM dendrimer-Magnevist/E complex, and (NCL26) G4 pyrrolidinone terminated PAMAM dendrimer-Magnevist/E complex. Commercially available Magnevist/E (NCL24) was used as a control. NCL studies addressed in this report can be divided into three main categories: physicochemical characterization; immunotoxicology; in vitro toxicology.	
Investigation Disease		
Investigation Disease Term Accession Number		
Investigation Disease Term Source REF		
Investigation Outcome		
Investigation Submission Date	12/1/2006	
Investigation Public Release Date	12/1/2006	
INVESTIGATION PUBLICATIONS		
Investigation PubMed ID	18095846	
Investigation Publication DOI	10.2217/17435889.2.6.789	
Investigation Publication Author list	Hall JB; Dobrovolskaia MA; Patri AK; McNeil SE	
Investigation Publication Title	Characterization of nanoparticles for therapeutics	
Investigation Publication Status	peer reviewed	
Investigation Publication Status Term Accession Number		
Investigation Publication Status Term Source REF	NPO	
INVESTIGATION CONTACTS		
Investigation Person Last Name	McNeil	Patri
Investigation Person First Name	Scott	Anil
Investigation Person Mid Initials		
Investigation Person Email	mcneils@mail.nih.gov	patria@mail.nih.gov
Investigation Person Phone	3018466939	3018465237
Investigation Person Fax		
Investigation Person Address	NSC 1050 Boyles Street, Frederick, MD 21702	NSC 1050 Boyles Street, F
Investigation Person Affiliation	Nanotechnology Characterization Laboratory	Nanotechnology Character
Investigation Person Roles	investigator	investigator
Investigation Person Roles Term Accession Number		
Investigation Person Roles Term Source REF	MO	MO

Ontology References

Investigation Description

Publications

Contacts

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Investigation File (cont.)

STUDY	
Study Identifier	NCL200612A-SIZE
Study Title	Size by DLS
Study Submission Date	Dec-06
Study Public Release Date	Dec-06
Study Description	Dynamic light scattering (DLS) technique was used to measure the hydrodynamic size of this dendritic nanomaterial. The effects of sample concentration, buffer, and temperature on the hydrodynamic size (stability) also were measured. Purity was analyzed by HPLC and Capillary Electrophoresis. MALDI-TOF Mass spectrometry was used to obtain the molecular weight information and to determine the purity, existence of dimers, trimers, and trailing generations in the sample. Gadolinium quantitation, which is important to determine the relaxivity as a MRI contrast agent, was carried out by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). Fractionation methods such as Size Exclusion Chromatography (SEC) and Asymmetric-flow Field Flow Fractionation (AFFF) were used to determine the molecular weight information as well as purity. Finally, a 3T clinical MRI machine was used to obtain relaxivity measurements on this sample to compare with free Magnevist/E. No significant relaxivity change was observed upon association of Magnevist/E with the dendrimer.
Study Disease	
Study Disease Term Accession Number	
Study Disease Term Source REF	
Study Outcome	For NCL22, the size is slightly larger when dispersed in saline compared to PBS. In PBS, the size is independent of temperature. This is in contrast to NCL23, which is larger in PBS than in saline. NCL23 also shows temperature dependence, as its size decreases slightly with increased temperature in PBS. Finally, NCL20 is larger when dispersed in PBS compared to saline.
STUDY SAMPLES	
Study Sample File Name	m_NCL-21.txt; m_NCL-22.txt; m_NCL-23.txt
Study Sample File URI	
Study Sample File Type	material sample; material sample; material sample
Study Sample File Type Term Accession Number	
Study Sample File Type Term Source REF	
Study Sample File Version	
Study Sample File Description	
STUDY DESIGN DESCRIPTORS	
Study Design Type	comparison
Study Design Type Term Accession Number	
Study Design Type Term Source REF	
STUDY PUBLICATIONS	
Study PubMed ID	
Study Publication DOI	
Study Publication Author list	
Study Publication Title	
Study Publication Status	
Study Publication Status Term Accession Number	
Study Publication Status Term Source REF	

Study Description

Sample Files

Design

Publication

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nano-TAB File Development

1. Describe the Investigation and Study

2. Identify Study Samples

3. Record Assay Conditions and Measurements

- **Study samples include specimen samples (e.g. cell lines, animals) and material samples (e.g. nanomaterials, small molecules)**
  - Specimens are the entities in which the materials are applied
- **Specimen samples are described in the Specimen File**
- **Material samples are described in the Material File**

Specimen File

- **The Specimen File is optional as not all nanomaterial characterizations (e.g. physico-chemical) involve a specimen**
- **Allows for the description of specimens associated with the study**
- **The Specimen File is the ISA-TAB Study file with nano-TAB extensions**
- **The Specimen File leverages the naming convention s_xxxx.txt (where xxxx is the name of the specimen)**
- **The Specimen File is a horizontal based spreadsheet format. Multiplicity is represented within a field using semi-colons**
- **The Specimen File consists of the following fields:**

  - Specimen source and sample name
  - Characteristics [ ]
  - Protocol references and parameters [ ]

Specimen File

CFU-GM Assay

Sample Identifiers

Sample Characteristics

Specimen Sample Source Name	Specimen Sample Name	Characteristics[organism]	Characteristics[cell type]	Characteristics[supplier]
GM	GM1	mus musculus	granulocyte macrophage	in-house facility
GM	GM2	mus musculus	granulocyte macrophage	in-house facility
GM	GM3	mus musculus	granulocyte macrophage	in-house facility
GM	GM4	mus musculus	granulocyte macrophage	in-house facility
GM	GM5	mus musculus	granulocyte macrophage	in-house facility
GM	GM6	mus musculus	granulocyte macrophage	in-house facility

Sample Preparation Protocol Parameters

Protocol REF	Parameter Value [medium]
growth conditions	Iscove's Modified Dulbecco's Media
growth conditions	Iscove's Modified Dulbecco's Media
growth conditions	Iscove's Modified Dulbecco's Media
growth conditions	Iscove's Modified Dulbecco's Media
growth conditions	Iscove's Modified Dulbecco's Media
growth conditions	Iscove's Modified Dulbecco's Media

Material File

- **The Material file is the primary file for describing the nanomaterial formulation and structure**
- **The Material file describes the composition of the material and allows for the comparison of nanomaterials across nanotechnology resources**
- **The Material File leverages the naming convention m_xxxx.txt (where xxxx is the name of the material)**
- **The Material file also allows for the association with optional files inlcuding a Structure file for representing the 3D structure of the nanomaterial**
- **The Material file format leverages a vertical based spreadsheet and includes the following sections:**

  - MATERIAL SAMPLE
  - MATERIAL COMPONENT
  - MATERIAL LINKAGE

Material File

Material Sample Section

Material Identifiers

Material Characteristics

Material Files

MATERIAL SAMPLE			
Material Sample Source Name	NCL-23		
Material Sample Name	NCL-23-F1		
Material Sample Type	nanoparticle sample		
Material Sample Type Term Accession Number	NPO_1404		
Material Sample Type Term Source REF	NPO		
Material Sample Description	G4.5 COONa terminated PAMAM dendrimer-MagnevistÂ® complex		
Material Sample Synthesis			
Material Sample Design Rationale			
Material Sample Design RationaleTerm Accession Number			
Material Sample Design Rationale Term Source REF			
Material Sample Characteristic			
Material Sample Characteristic Term Accession Number			
Material Sample Characteristic Term Source REF			
Material Sample Characteristic Value			
Material Sample Characteristic Value Term Accession Number			
Material Sample Characteristic Value Term Source REF			
Material Sample Characteristic Statistic			
Material Sample Characteristic Statistic Term Accession Number			
Material Sample Characteristic Statistic Term Source REF			
Material Sample Characteristic Unit			
Material Sample Characteristic Unit Term Accession Number			
Material Sample Characteristic Unit Term Source REF			
Material Sample Intended Application	MRI Contrast Agent		
Material Sample Intended Application Term Accession Number	NPO_581		
Material Sample Intended Application Term Source REF	NPO		
Material Sample File Name	ncl-23_composition.png; ncl-23_structure.pdb		
Material Sample File Location			
Sampe Material File Type	image; structure		
Material Sample File Type Term Accession Number			
Material Sample File Type Term Source REF			
Material Sample File Version	1.0; 1.0		
Material Sample File Description	NCL23 composition schematic; 3D structure of the dendrimer with annotated voids		

Material File

Material Component Section

Material Component Identifier

Material Component Characteristics

Material Component Files

MATERIAL COMPONENT			
Material Component Name	NCL-23-F1-N1	NCL-23-F1-N1-M1	NCL-23-F1-N1-M2
Material Component Type	dendrimer	core	small molecule
Material Component Type Term Accession Number	NPO_735	NPO_279	
Material Component Type Term Source REF	NPO	NPO	
Material Component Description			
Material Component Chemical Name		diaminobutane	magnevist
Material Component Chemical Term Accession Number			CHEBI.31797
Material Component Chemical Term Source REF			CHEBI
Material Component Characteristic	branch; generation		amount; molecular formula
Material Component Characteristic Term Accession Number	NPO_776; NPO_224		NPO_1217;
Material Component Characteristic Term Source REF	NPO; NPO		NPO;
Material Component Characteristic Value	1-4; 4.5		0; [Gd+3] .CNC[C@H] (O) [C@@H] (O) [C@H] (O) [C@H] (O) CO.CNC[C@H] (O) [C@@H] (O) [C@H] (O) [C@H] (O) CO.OC(=O) CN(CCN(CCN(CC(O) =O) CC([O-]) =O) CC([O-]) =O) CC([O-]) =O
Material Component Characteristic Value Term Accession Number			
Material Component Characteristic Value Term Source REF			
Material Component Characteristic Statistic			
Material Component Characteristic Statistic Term Accession Number			
Material Component Characteristic Statistic Term Source REF			
Material Component Characteristic Unit			mL; SMILES
Material Component Characteristic Unit Term Accession Number			UO_0000101;
Material Component Characteristic Unit Term Source REF			UO;
Material Component Intended Application			MRI Contrast Agent
Material Component Intended Application Term Accession Number			NPO_581
Material Component Intended Application Term Source REF			NPO
Material Component File Name			magnevist_structure.png
Material Component File Type			image
Material Component File Type Term Accession Number			
Material Component File Type Term Source REF			
Material Component File Version			

Material File

Material Linkage Section

Material Linkage Identifier

Material Linkage Characteristics

MATERIAL LINKAGE			
Material Linkage Name	NCL-23-F1-L1		
Material Linkage Type	association		
Material Linkage Type Term Accession Number			
Material Linkage Type Term Source REF			
Material Linkage Component A	NCL-23-F1-N1-M1		
Material Linkage Component B	NCL-23-F1-N1-M2		
Material Linkage Component Location	exterior dendrimer surface		
Material LinkageComponent Location Term Accession Number			
Material Linkage Component Location Term Source REF			
Material Linkage Characteristic	bond type		
Material Linkage Characteristic Term Accession Number			
Material Linkage Characteristic Term Source REF			
Material Linkage Characteristic Value			
Material Linkage Characteristic Value Term Accession Number			
Material Linkage Characteristic ValueTerm Source REF			
Material Linkage Characteristic Statistic			
Material Linkage Characteristic Statistic Term Accession Number			
Material Linkage Characteristic Statistic Term Source REF			
Material Linkage Characteristic Unit			
Material Linkage Characteristic Unit Term Accession Number			
Material Linkage Characteristic Unit Term Source REF			

nano-TAB File Development

1. Describe the Investigation and Study

2. Identify Study Samples

3. Record Assay Conditions and Measurements

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Assay File

- **The Assay file describes the protocol parameters and factors (e.g. temperature, media solvent, concentration) associated with each assay and provides references to assay results including measurements, derived data files, and other file types**
- **The Assay File leverages the naming convention a_xxxx.txt (where xxxx is the name of the assay)**
- **The nano-TAB effort is focusing on developing Assay files for the top common assays across nanomaterial resources**
- **The Assay file format leverages a horizontal based spreadsheet format and includes the following sections:**

  - SAMPLE NAMES
  - PARAMETERS
  - FACTORS
  - ASSAY MEASUREMENTS
  - ASSAY FILES

Assay File

Size by DLS

Sample Identifiers

Protocol Reference

Material Sample Name	Protocol REF	ParameterValue[pH of solutio	Parameter Value [NaCl concentration	Performer	Date
NCL-20-F1	Hydrodynamic Size/Size Distribution via Dynamic Ligh	7.4		Anil Patri	2010:05:12
NCL-20-F1	Hydrodynamic Size/Size Distribution via Dynamic Ligh	7.4		Anil Patri	2010:05:12
NCL-22-F1	Hydrodynamic Size/Size Distribution via Dynamic Ligh	7.4		Anil Patri	2010:05:12
NCL-22-F1	Hydrodynamic Size/Size Distribution via Dynamic Ligh	7.4		Anil Patri	2010:05:12
NCL-22-F1	Hydrodynamic Size/Size Distribution via Dynamic Ligh	7.4		Anil Patri	2010:05:12
NCL-23-F1	Hydrodynamic Size/Size Distribution via Dynamic Ligh	7.4		Anil Patri	2010:05:12
NCL-23-F1	Hydrodynamic Size/Size Distribution via Dynamic Ligh	7.4		Anil Patri	2010:05:12
NCL-23-F1	Hydrodynamic Size/Size Distribution via Dynamic Ligh	7.4		Anil Patri	2010:05:12

Assay Name

Study Factors

Assay Name	Factor Value[temperature]	Unit	Term Source	Term Acces	Factor Value[media solvent]	Measurement Value[size]	Statistic	Unit	Term Source
Size by DLS	25	celsius	UO		saline	5.2	z-average	nm	UO
Size by DLS	25	celsius	UO		PBS	8.6	z-average	nm	UO
Size by DLS	25	celsius	UO		saline	8.5	z-average	nm	UO
Size by DLS	25	celsius	UO		PBS	6.6	z-average	nm	UO
Size by DLS	37	celsius	UO		PBS	7.9	z-average	nm	UO
Size by DLS	25	celsius	UO		saline	7.4	z-average	nm	UO
Size by DLS	25	celsius	UO		PBS	8.4	z-average	nm	UO
Size by DLS	37	celsius	UO		PBS	9.8	z-average	nm	UO

Assay Measurements

Assay Files

Term Acces	Measurement Value[Peak size]	Unit	Term Source	Term Acces	Measurement Value[pdl]	Image File	Derived Data File
	4.4	nm	UO		0.122	distribution20.jpg	ncl_20.xls
	6.2	nm	UO		0.211		
	6.0	nm	UO		0.200	distribution22.jpg	ncl_22.xls
	5.2	nm	UO		0.214		
	5.1	nm	UO		0.282		
	5.3	nm	UO		0.235	distribution23.jpg	ncl_23.xls
	6.1	nm	UO		0.265		
	5.6	nm	UO		0.358		

Assay File

CFU-GM

Sample Identifiers

Protocol Reference

Specimen Sample Name	Material Sample Name	Protocol REF	Performer	Date	Assay Name
GM1	NCL-22-F1	Mouse Granulocyte-Macrophage Colony-Forming Unit Assay	Marina Dobrovol	2010:05:12	Mouse Granulocyte-Macrophage Colony-Forming Unit Assa
GM2	NCL-22-F1	Mouse Granulocyte-Macrophage Colony-Forming Unit Assay	Marina Dobrovol	2010:05:12	Mouse Granulocyte-Macrophage Colony-Forming Unit Assa
GM3	NCL-23-F1	Mouse Granulocyte-Macrophage Colony-Forming Unit Assay	Marina Dobrovol	2010:05:12	Mouse Granulocyte-Macrophage Colony-Forming Unit Assa
GM4	NCL-23-F1	Mouse Granulocyte-Macrophage Colony-Forming Unit Assay	Marina Dobrovol	2010:05:12	Mouse Granulocyte-Macrophage Colony-Forming Unit Assa
GM5	NCL-24-F1	Mouse Granulocyte-Macrophage Colony-Forming Unit Assay	Marina Dobrovol	2010:05:12	Mouse Granulocyte-Macrophage Colony-Forming Unit Assa
GM6	NCL-24-F1	Mouse Granulocyte-Macrophage Colony-Forming Unit Assay	Marina Dobrovol	2010:05:12	Mouse Granulocyte-Macrophage Colony-Forming Unit Assa

Study Factors

Assay Measurements

Factor Value[concentration]	Unit	Term Source Ref	Term Access	Measurement Value[# of CFU-GM colonies]	Image File
0.25	mg/mL	UO			CFU_GM_plot.jpg
1	mg/mL	UO			CFU_GM_plot.jpg
0.25	mg/mL	UO		46	CFU_GM_plot.jpg
1	mg/mL	UO		40	CFU_GM_plot.jpg
0.25	mg/mL	UO			CFU_GM_plot.jpg
1	mg/mL	UO			CFU_GM_plot.jpg

Assay File

MTT

Sample Identifiers

Protocol Reference

Specimen Sample Name	Material Sample Name	Protocol REF	Parameter Value [cell type]	Performer	Date	Assay Name
PK1cell-low-0h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-low-6h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-low-24h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-low-48h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-med-0h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-med-6h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-med-24h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-med-48h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-high-0h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-high-6h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-high-24h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-high-48h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-vhi-0h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-vhi-6h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-vhi-24h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells
PK1cell-vhi-48h	NCL-23-F1	LLC-PK1 Kidney Cytoxicity Assay	LLC-PK1	Marina Dobrovolskaia	2010:05:12	MTT Cytotoxicity Assay in PK1 Cells

Study Factors

Assay Measurements

Factor Value[time]	Unit	Term Source	Term Acce	Factor Value[concentration]	Unit	Term Source Ref	Term Acce	Measurement Value[% cell viability]	Image File
0	hours	UO		0.004	mg/mL	UO		122.4	MTT_cytotoxicity_LLC-PK
6	hours	UO		0.004	mg/mL	UO		99.1	MTT_cytotoxicity_LLC-PK
24	hours	UO		0.004	mg/mL	UO		108.4	MTT_cytotoxicity_LLC-PK
48	hours	UO		0.004	mg/mL	UO		112.8	MTT_cytotoxicity_LLC-PK
0	hours	UO		0.008	mg/mL	UO		96.6	MTT_cytotoxicity_LLC-PK
6	hours	UO		0.008	mg/mL	UO		106.8	MTT_cytotoxicity_LLC-PK
24	hours	UO		0.008	mg/mL	UO		98.1	MTT_cytotoxicity_LLC-PK
48	hours	UO		0.008	mg/mL	UO		166.5	MTT_cytotoxicity_LLC-PK
0	hours	UO		0.016	mg/mL	UO		124.3	MTT_cytotoxicity_LLC-PK
6	hours	UO		0.016	mg/mL	UO		96	MTT_cytotoxicity_LLC-PK
24	hours	UO		0.016	mg/mL	UO		112.4	MTT_cytotoxicity_LLC-PK
48	hours	UO		0.016	mg/mL	UO		91.3	MTT_cytotoxicity_LLC-PK
0	hours	UO		0.031	mg/mL	UO		114.6	MTT_cytotoxicity_LLC-PK
6	hours	UO		0.031	mg/mL	UO		109.3	MTT_cytotoxicity_LLC-PK
24	hours	UO		0.031	mg/mL	UO		103.6	MTT_cytotoxicity_LLC-PK
48	hours	UO		0.031	mg/mL	UO		136.3	MTT_cytotoxicity_LLC-PK

Agenda

- **nano-TAB Introduction**
- **nano-TAB Structure**
  - Investigation File
  - Specimen File
  - Material File
  - Assay File
- **Getting Started**
- **nano-TAB Future**

Getting Started

caBIG® Nano-WG Site:
http://sites.google.com/site/cabignanowg/data-sharing-and-nanotechnology-standards/nanotab

1. **Use nano-TAB template to create nano-TAB files:**
   - http://gforge.nci.nih.gov/docman/view.php/69/23299/nano-TAB%20Template%2010122010.xls
2. **Leverage template glossary for definitions:**
   - http://gforge.nci.nih.gov/docman/view.php/69/23300/nano-TAB%20Template%20Glossary%2010122010.xls
3. **View example files:**
   - http://sites.google.com/site/cabignanowg/data-sharing-and-nanotechnology-standards/nanotab
4. **Navigate the BioPortal ontology for terms:**
   - http://bioportal.bioontology.org/visualize/44182
5. **Complete nano-TAB files and send to the nano-TAB Listserv:**
   - nano-tab-l@list.nih.gov

Contact the nano-TAB Listserv for any assistance

caBIG

Agenda

- **nano-TAB Introduction**
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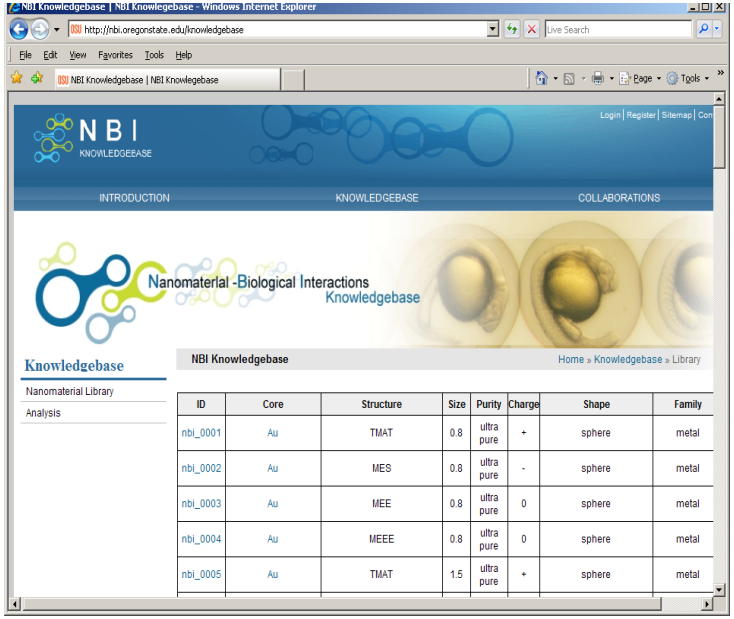
nano-TAB Future

- **Obtain feedback from pilot efforts**
- **Modify nano-TAB based on feedback**
- **Develop additional exemplars**
- **Develop tools for validating, loading, and exporting nano-TAB to/from nanotechnology resources like caNanoLab and the NBI**

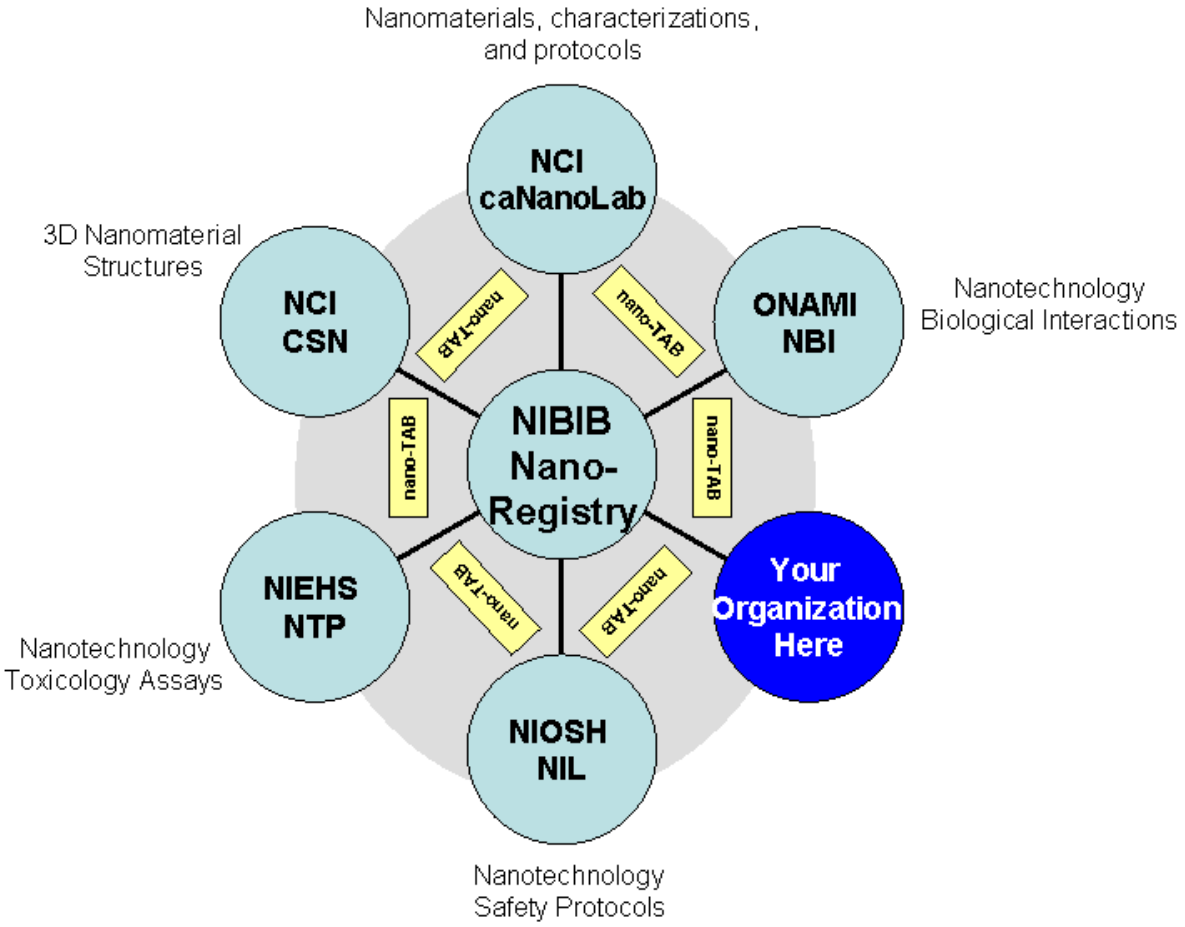
http://cananolab.nci.nih.gov/caNanoLab/welcome.do



http://nbi.oregonstate.edu/knowledgebase

caBIG

nano-TAB is a community-driven effort



nano-TAB References

- **nano-TAB Project Site**
  - http://sites.google.com/site/cabignanowg/data-sharing-and-nanotechnology-standards/nanotab
- **ASTM nano-TAB Work Item**
  - http://www.astm.org/DATABASE.CART/WORKITEMS/WK28974.htm
- **ISA-TAB**
  - http://isatab.sourceforge.net/
- **caBIG ICR Nano WG Data Standards Document**
  - http://sites.google.com/site/cabignanowg/data-sharing-and-nanotechnology-standards/data-sharing-standards
- **NanoParticle Ontology (NPO)***
  - http://www.nano-ontology.org
  - http://purl.bioontology.org/ontology/npo

** Developed as part of a CCNE project at Wash U*

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